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EXAMINER
LIN, JAMES

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,794	DANIELS, JOHN JAMES	
	Examiner	Art Unit	
	Jimmy Lin	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,8,9,18 and 25-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8,9,18 and 25-29* is/are rejected.

7)☒ Claim(s) *30 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 8-9, 18, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Broer et al. (WO 2002/42832) in view of Hikmet (U.S. Patent No. 5,748,271).

Broer discloses a method of making a liquid crystal display (LCD) (abstract). A mixture of photo-polymerizable material and liquid crystal molecules are formed over an electrode 8. The mixture is pattern-wise irradiated with actinic radiation through a mask. Polymerization takes place upon irradiation. The liquid crystal diffuses out of the illuminated regions and the polymer diffuses into the illuminated regions (paragraph bridging pg. 22-23; Fig. 5A).

Broer does not explicitly teach that the mixture of photo-polymerizable material and liquid crystal molecules comprises a light active material. However, Broer does teach that the liquid crystal material can be mixed with one or more dichroic dyes (pg. 15, lines 33-34), and Hikmet teaches that dichroic dyes can exhibit EL properties (col. 4, lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of invention to have used the dichroic dye of Hikmet that exhibits EL properties in the liquid crystal mixture of Broer with a reasonable expectation of success because Broer teaches that the liquid crystal material can be mixed with any dichroic dyes. The dichroic dyes are interpreted to be the light active material as claimed.

Broer and Hikmet do not explicitly teach forming chains of the light active material in the first region. However, molecules of light active material will necessarily come into contact with other molecules of light active material to thereby form a chain.

Claim 18: Broer teaches that the electrodes can be patterned (pg. 6, lines 22-24). The electrodes can generate an electric field that aligns the light active material (pg. 14, lines 1-7).

Claims 2,26: Broer teaches that the light active material is disposed between first and second electrodes (pg. 5, lines 25-29).

Claims 3,9,27: Hikmet teaches that the light active material can be a perylene (i.e., an organic compound) (col. 4, lines 18-29). The light active material exhibits EL properties, which would necessarily emit light when a voltage is applied to the first and second electrodes.

Claim 8,28: The perylene dye of Hikmet is a conjugated molecule that exhibits EL properties.

3. Claims 1-3, 8-9, 18, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. (U.S. Patent No. 6,304,309) in view of Hikmet '271.

Yamanaka discloses a method of making an LCD (abstract). A mixture of polymer precursor and a liquid crystal material is applied over a bottom electrode 9. The mixture is selectively irradiated with UV light through openings 9a and 5a. As a result of the light exposure, the precursor diffuses into the UV light area and polymerizes to form supporting members 31. The liquid crystal is concentrated in the unexposed areas to form the liquid crystal layer 41 (col. 63, lines 1-30; Figs. 47(d)-50(i)).

Yamanaka does not explicitly teach that the mixture of polymer precursor and a liquid crystal material comprises a light active material. However, Yamanaka does teach that a dichroic dye can be added to the liquid crystal mixture (col. 63, lines 10-11; col. 64, lines 4-7). Hikmet teaches the obviousness of using a dichroic dye having EL properties, as discussed above.

Yamanaka and Hikmet do not explicitly teach forming chains of the light active material in the first region. However, molecules of light active material will necessarily come into contact with other molecules of light active material to thereby form a chain.

Claim 18: Yamanaka teaches that the electrodes 9 can be patterned (Fig. 47(d)). The electrodes can generate a voltage to align the light active material (col. 37, lines 1-6).

Claims 2,26: Yamanaka teaches that the light active material is disposed between a first electrode 9 and a second electrode 14 (Fig. 50(i)).

Claims 3, 8-9, and 27-28 are rejected for substantially the same reasons as discussed above.

4. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Broer '832 in view of Hikmet '271 as applied to claim 1 above, and further in view of Mase (U.S. Patent No. 5,178,571).

Broer and Hikmet are discussed above, but do not explicitly teach that the light active material comprises active microcapsules comprising an OLED material encapsulated within a polymer shell. However, Mase teaches that liquid crystals can be encapsulated into capsules to achieve a uniform dispersion of the liquid crystal in order to provide a higher quality image (col. 1, line 63-col. 2, line 6). The liquid crystal 14 and the dye 15 can be encapsulated by a layer of poly(vinyl alcohol) (i.e., a polymer shell) (Figs. 1-2; col. 3, lines 51-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided the liquid crystal and dye of Broer and Hikmet in encapsulated capsules of Mase with a reasonable expectation of success. One would have been motivated to do so in order to have provided a higher quality display.

5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka '309 in view of Hikmet '271 as applied to claim 1 above, and further in view of Mase '571 for substantially the same reasons as discussed immediately above.

6. Claims 1-3, 8-9, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rorison et al. (GB 2344691 A) in view of Krohn et al. (U.S. Publication No. 2003/0022957).

Rorison discloses a method of making a polarized EL device, wherein the light active materials can be cross-linked (pg. 16, 1st full paragraph). The polarization of the light active materials can be done by selectively fixing the fluid matrix with a UV light (pg. 12, 2nd and 3rd full paragraphs).

Rorison does not explicitly teach cross-linking a monomer from a mixture containing the monomer and the light active material. However, it is well known in the EL art to use a mixture of a monomer and a light active material in the process of making a cross-linked EL layer (see e.g., Krohn, [0190]-[0193]). It would have been obvious to one of ordinary skill in the art at the time of invention to cross-link the monomer from a mixture containing a monomer and a light

active material because such a mixture is suitable for the process of making a cross-linked EL layer.

Upon selective cross-linking, the polymerized EL portion would contain the light active material in a matrix of polymer material. The matrix of polymer material would necessarily have portions containing the light active material and portions that lack the light active material. The portions containing the light active material has been interpreted to be a concentration of the light active material at the first region while the portions lacking the light active material has been interpreted to be a concentration of polymer at the second region.

Rorison and Krohn do not explicitly teach forming chains of the light active material in the first region. However, molecules of light active material will necessarily come into contact with other molecules of light active material to thereby form a chain.

Claim 25: Rorison and Krohn do not explicitly teach the migration of the monomer by selective cross-linking of the monomer. However, the exposure to light energizes the monomers to start a reaction with other monomers. In other words, the monomers link to one another to form a polymer. Such a reaction would necessarily cause some sort of migration of the monomers at the molecular level.

Claim 2,26: Rorison teaches that the light active material 22 is disposed between a cathode layer 23 and an anode layer 21 (pg. 8, 4th paragraph).

Claim 3,27: Rorison teaches that the EL device can have an organic emitter layer (pg. 1, 2nd paragraph).

Claim 8,28: Rorison teaches that PPV is a suitable light active material (pg. 10, 2nd paragraph). The present specification exemplifies PPV as a suitable conjugated EL polymer (pg. 99, lines 10-15).

Claim 9: Rorison teaches that the light active layer 54 and a bottom electrode 52 are deposited over a substrate 51 (Fig. 9f).

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rorison '691 in view of Krohn '957 as applied to claim 18, and further in view of Song (U.S. Publication No. 2001/0050746).

Rorison and Krohn are discussed above. Rorison teaches that an electric field or a magnetic field is applied to the light active material in order to align the molecules (pg. 12, 2nd full paragraph), but does not explicitly teach using the patterned electrodes to define the aligning field. However, the Examiner takes Official Notice that it is well known in the art of display devices that an electric field can be applied using electrodes to align molecules between the electrodes (see, e.g., Song, [0004]). The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have applied an electric field using the patterned electrodes of Rorison and Krohn to have aligned at least one of the light active layers with a reasonable expectation of success because it is well known in the art of display devices that creating an electric field with the display electrodes is suitable for aligning molecules between the electrodes.

Response to Arguments

8. Applicant's arguments filed 9/4/2007 have been fully considered but they are not persuasive.

Applicant argues on pg. 6 that Rorison and Krohn do not disclose, teach, or suggest forming chains of light active material. However, molecules of light active material will necessarily come into contact with other molecules of light active material to thereby form a chain.

Applicant argues on pg. 6-7 that Rorison's molecules of the emitter layer are not "OLED particulate" as recited in amended claim 9. However, the emitter layer of Rorison comprises a plurality of OLED molecules, each of which can be interpreted to be a particulate as claimed.

Applicant argues on pg. 8 that Broer and Hikmet do not disclose, teach, or suggest forming chains of light active material as recited in amended claims 1 and 25 or forming chains of OLED particulate as recited in amended claim 9. However, this argument is incorrect for the same reasons as discussed above.

Applicant argues on pg. 9-10 that Yamanaka and Hikmet do not disclose, teach, or suggest forming chains of light active material as recited in amended claims 1 and 25 or forming

chains of OLED particulate as recited in amended claim 9. However, this argument is incorrect for the same reasons as discussed above.

Allowable Subject Matter

9. Claims 30-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not reasonably teach or suggest forming chains of an OLED material encapsulated within a polymer shell by application of an electric field to the mixture of the light active material and the monomer.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JL

JL

FRED J. PARKER
PRIMARY EXAMINER